```
=> fil reg
FILE 'REGISTRY' ENTERED AT 14:18:22 ON 26 JUN 2007
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STRUCTURE FILE UPDATES:   25 JUN 2007  HIGHEST RN 939040-66-1
DICTIONARY FILE UPDATES:  25 JUN 2007  HIGHEST RN 939040-66-1

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH December 2, 2006

  Please note that search-term pricing does apply when
  conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and
predicted properties as well as tags indicating availability of
experimental property data in the original document.  For information
on property searching in REGISTRY, refer to:

http://www.cas.org/support/stngen/stndoc/properties.html

=> d que stat l8
L4                SCR 2043
L6                STR
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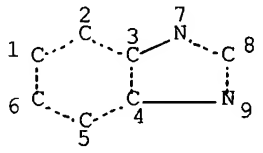


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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   9

STEREO ATTRIBUTES: NONE
L8          1579 SEA FILE=REGISTRY SSS FUL L6 AND L4

100.0% PROCESSED    1607 ITERATIONS                          1579 ANSWERS
SEARCH TIME: 00.00.01


=> d his nofile

     (FILE 'HOME' ENTERED AT 11:24:35 ON 26 JUN 2007)

     FILE 'HCAPLUS' ENTERED AT 11:24:45 ON 26 JUN 2007
L1             1 SEA ABB=ON  PLU=ON  US2004013925/PN
                 D IALL
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                SEL RN

     FILE 'REGISTRY' ENTERED AT 11:25:14 ON 26 JUN 2007
L2           20 SEA ABB=ON  PLU=ON  (110-86-1/BI OR 119-65-3/BI OR
                120-72-9/BI OR 120-73-0/BI OR 131714-35-7/BI OR 1333-74-0
                /BI OR 25232-42-2/BI OR 25233-30-1/BI OR 25823-41-0/BI
                OR 288-13-1/BI OR 288-32-4/BI OR 32109-42-5/BI OR
                50641-39-9/BI OR 7664-38-2/BI OR 7664-93-9/BI OR
                7732-18-5/BI OR 7782-44-7/BI OR 9002-98-6/BI OR 9003-47-8
                /BI OR 91-22-5/BI)
                D SCA

     FILE 'LREGISTRY' ENTERED AT 11:47:00 ON 26 JUN 2007
L3              STR

     FILE 'REGISTRY' ENTERED AT 11:48:25 ON 26 JUN 2007
L4              SCR 2043
L5           50 SEA SSS SAM L3 AND L4
L6              STR L3
L7           50 SEA SSS SAM L6 AND L4
L8         1579 SEA SSS FUL L6 AND L4
                SAV L8 WEI537/A
L9            1 SEA ABB=ON  PLU=ON  L2 AND L8
                D SCA
L10           1 SEA ABB=ON  PLU=ON  L2 AND "(C6H7N)X"/MF
L11          15 SEA ABB=ON  PLU=ON  L2 AND N/ELS
L12           1 SEA ABB=ON  PLU=ON  7664-38-2/RN
L13           1 SEA ABB=ON  PLU=ON  7664-93-9/RN
L14      346163 SEA ABB=ON  PLU=ON  ?IMIDAZOLE?/CNS
L15        5792 SEA ABB=ON  PLU=ON  L14 AND PMS/CI
L16           4 SEA ABB=ON  PLU=ON  L2 AND L15
L17          11 SEA ABB=ON  PLU=ON  L11 NOT L16

     FILE 'HCAPLUS' ENTERED AT 13:58:28 ON 26 JUN 2007
L18        1567 SEA ABB=ON  PLU=ON  L8
L19       11763 SEA ABB=ON  PLU=ON  L10
L20      120682 SEA ABB=ON  PLU=ON  L11
L21       11737 SEA ABB=ON  PLU=ON  L15
L22             QUE ABB=ON  PLU=ON  SOLID?(2A)(POLYM? OR COPOLYM? OR
                HOMOPOLYM?)
L23             QUE ABB=ON  PLU=ON  ELECTROLY?
L24             QUE ABB=ON  PLU=ON  (PROTON OR H OR HYDROGEN OR H2)(2A)CO
                NDUCT?
L25             QUE ABB=ON  PLU=ON  ELECTROLY?(3A)(POLYM? OR COPOLYM? OR
                HOMOPOLYM?)
L26      151132 SEA ABB=ON  PLU=ON  L12 OR PHOSPHORIC(A)ACID OR H3PO4
L27      444055 SEA ABB=ON  PLU=ON  L13 OR (SULFURIC OR SULPHURIC OR
                SULFERIC OR SULPHERIC)(A)ACID OR H2SO4
L28             QUE ABB=ON  PLU=ON  ?IMIDAZOLE?
L29             QUE ABB=ON  PLU=ON  ACID##(2A)INORG?
L30       29597 SEA ABB=ON  PLU=ON  (L29 OR L18 OR L19 OR L20 OR L21)
                AND (L29 OR L26 OR L27)
L31        1990 SEA ABB=ON  PLU=ON  L30 AND L23
L32         131 SEA ABB=ON  PLU=ON  L31 AND L24
L33          81 SEA ABB=ON  PLU=ON  L32 AND L25
L34          15 SEA ABB=ON  PLU=ON  L32 AND L22
L35          13 SEA ABB=ON  PLU=ON  L33 AND L34
L36          15 SEA ABB=ON  PLU=ON  L34 OR L35
L37          13 SEA ABB=ON  PLU=ON  L36 AND (1840-2002)/PY,PRY,AY
L38        1390 SEA ABB=ON  PLU=ON  (L8 OR L10 OR L11 OR L15)(L)L23
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L39          34 SEA ABB=ON  PLU=ON  L33 AND L38
L40          27 SEA ABB=ON  PLU=ON  L39 NOT L36
L41           8 SEA ABB=ON  PLU=ON  L40 AND (1840-2002)/PY,PRY,AY


=> fil hcap
FILE 'HCAPLUS' ENTERED AT 14:18:33 ON 26 JUN 2007
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FILE COVERS 1907 - 26 Jun 2007  VOL 147 ISS 1
FILE LAST UPDATED: 25 Jun 2007  (20070625/ED)

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 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

=> d l36 ibib abs hitstr hitind 1-15

L36  ANSWER 1 OF 15  HCAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:         2006:232107  HCAPLUS  Full-text
DOCUMENT NUMBER:          144:295877
TITLE:                    Manufacture of electrolyte membrane by
                          irradiation and doping for fuel cell
INVENTOR(S):              Kawahara, Mitsuyasu; Takami, Masanobu;
                          Taniguchi, Takumi; Rikukawa, Masahiro; Takeoka,
                          Hiroko
PATENT ASSIGNEE(S):       Toyota Motor Corp., Japan
SOURCE:                   Jpn. Kokai Tokkyo Koho, 10 pp.
                          CODEN: JKXXAF
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.           KIND   DATE        APPLICATION NO.        DATE
     ---------------      ----   --------    --------------------
     --------
     JP 2006073361         A     20060316    JP 2004-255669
                                                                   200409
                                                                   02

PRIORITY APPLN. INFO.:                       JP 2004-255669
                                                                   200409
                                                                   02
```
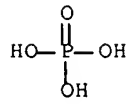

AB The manufacturing method involves the following steps: (1) applying radial ray (e.g., γ-ray, electron beam, and ion beam) to a basic **solid polymer** membrane in the presence of O and (2) doping a **proton-conductive** compound in the irradiated membrane. The obtained membrane has high **proton conductivity** and mech. strength.

IT **7664-38-2, Phosphoric acid,** uses
RL: DEV (Device component use); MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(dopant; manufacture of **electrolyte** membrane with high **proton conductivity** and mech. strength by irradiation and doping for fuel cell)

RN 7664-38-2 HCAPLUS

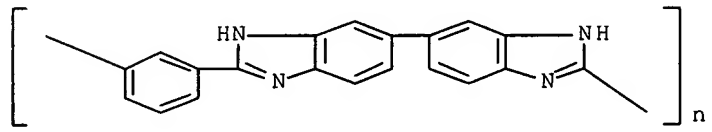
CN Phosphoric acid (CA INDEX NAME)



IT **25734-65-0**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of **electrolyte** membrane with high **proton conductivity** and mech. strength by irradiation and doping for fuel cell)

RN 25734-65-0 HCAPLUS

CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST **electrolyte** membrane irradn doping manuf fuel cell; ion cond mech strength **electrolyte** fuel cell manuf

IT Electron beams
Fuel cell **electrolytes**
Gamma ray
Ion beams
Ionic conductors
Radiation
(manufacture of **electrolyte** membrane with high **proton conductivity** and mech. strength by irradiation and doping for fuel cell)

IT Polybenzimidazoles
Polybenzoxazoles
Polyimides, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or

engineered material use); PROC (Process); USES (Uses)
(manufacture of **electrolyte** membrane with high **proton conductivity** and mech. strength by irradiation and doping for fuel cell)

IT Polybenzimidazoles
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polybenzodiimidazoles; manufacture of **electrolyte** membrane with high **proton conductivity** and mech. strength by irradiation and doping for fuel cell)

IT **7664-38-2, Phosphoric acid**, uses
RL: DEV (Device component use); MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(dopant; manufacture of **electrolyte** membrane with high **proton conductivity** and mech. strength by irradiation and doping for fuel cell)

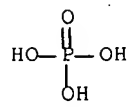
IT **25734-65-0**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of **electrolyte** membrane with high **proton conductivity** and mech. strength by irradiation and doping for fuel cell)

L36 ANSWER 2 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:328921 HCAPLUS Full-text
DOCUMENT NUMBER: 140:342159
TITLE: Polymer membranes for a membrane-electrode unit for fuel cell
PATENT ASSIGNEE(S): Sartorius A.-G., Germany
SOURCE: Ger. Gebrauchsmusterschrift, 12 pp.
CODEN: GGXXFR
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 202004000365	U1	20040422	DE 2004-202004000365	20040113
DE 10301810	A1	20040729	DE 2003-10301810	20030120
PRIORITY APPLN. INFO.:			DE 2003-10301810 IA	20030120

AB A membrane-electrode unit for **polymer electrolyte** fuel cells with an operating temperature ≤250° consists at least of two laminar gas distribution electrodes and a sandwich-like in-between arranged polymer membrane with ≥1 basic polymer as well as a dopant, provided between them. The gas distribution electrodes are so charged that they represent a dopant reservoir for the polymer membrane, whereby the polymer membrane is **proton -conductive** and firmly tied up to the gas distribution electrodes over the dopant after effect of pressure and temperature and has in the doped condition a conductivity of at least 0.1 S/m at a temperature of >25°.

IT **7664-38-2D, Phosphoric acid**, diester
82370-43-2, Polyimidazole
RL: DEV (Device component use); USES (Uses)
(polymer membranes for membrane-electrode unit for fuel cell)
RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)

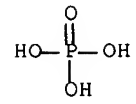


RN 82370-43-2 HCAPLUS
CN 1H-Imidazole, homopolymer (CA INDEX NAME)

CM 1

CRN 288-32-4
CMF C3 H4 N2

IT **7664-38-2, Phosphoric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polymer membranes for membrane-electrode unit for fuel cell)
RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



IC ICM H01M008-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
IT Fuel cells
(solid electrolyte; polymer
membranes for membrane-electrode unit for fuel cell)
IT 298-07-7, Di(2-ethylhexyl) phosphate 838-85-7, Diphenyl phosphate
7440-06-4, Platinum, uses **7664-38-2D, Phosphoric**
acid, diester 25013-01-8, Polypyridine **82370-43-2**
, Polyimidazole 128611-69-8, 1,3,4-Thiadiazole homopolymer
190201-51-5, Pyrimidine homopolymer
RL: DEV (Device component use); USES (Uses)
(polymer membranes for membrane-electrode unit for fuel cell)
IT **7664-38-2, Phosphoric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)

(polymer membranes for membrane-electrode unit for fuel cell)

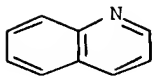
L36 ANSWER 3 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:36785 HCAPLUS Full-text
DOCUMENT NUMBER: 140:96885
TITLE: **Proton conductive solid polymer electrolyte** for electrochemical cell
INVENTOR(S): Komiya, Teruaki
PATENT ASSIGNEE(S): Honda Giken Kabushiki Kaisha, Japan
SOURCE: Eur. Pat. Appl., 14 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1381107	A2	20040114	EP 2003-254383	20030710
EP 1381107	A3	20061115		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2004047232	A	20040212	JP 2002-201718	20020710
JP 3884340	B2	20070221		
US 2004013925	A1	20040122	US 2003-616537	20030709
PRIORITY APPLN. INFO.:			JP 2002-201718 A	20020710

AB A material such as imidazole (nitrogen-containing heterocyclic compound), which has at least one lone pair, is dispersed in a basic **solid polymer** such as polybenzimidazole. The mole number of imidazole per g of polybenzimidazole is less than 0.0014 mol, preferably less than 0.0006 mol. The basic **solid polymer** is impregnated with an **acidic inorg.** liquid such as **phosphoric acid** and **sulfuric acid** to prepare a **proton conductive solid polymer electrolyte**.

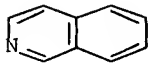
IT **91-22-5**, Quinoline, uses **110-86-1**, Pyridine, uses **119-65-3**, IsoQuinoline **120-72-9**, Indole, uses **120-73-0**, Purine **288-13-1**, Pyrazole **288-32-4**, Imidazole, uses **9002-98-6** **9003-47-8**, Polyvinylpyridine **25232-42-2**, Polyvinylimidazole **25233-30-1** **25823-41-0**, Poly(1-vinylpyrazole) **32109-42-5**, Poly(1H-benzimidazole-2,5-diyl) **50641-39-9** **131714-35-7**
RL: DEV (Device component use); USES (Uses)
(**proton conductive solid polymer electrolyte** for electrochem. cell)

RN 91-22-5 HCAPLUS
CN Quinoline (CA INDEX NAME)

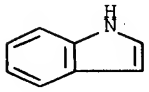


RN 110-86-1 HCAPLUS
CN Pyridine (CA INDEX NAME)

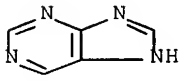
RN 119-65-3 HCAPLUS
CN Isoquinoline (CA INDEX NAME)



RN 120-72-9 HCAPLUS
CN 1H-Indole (CA INDEX NAME)



RN 120-73-0 HCAPLUS
CN 9H-Purine (CA INDEX NAME)



RN 288-13-1 HCAPLUS
CN 1H-Pyrazole (CA INDEX NAME)

RN 288-32-4 HCAPLUS

CN 1H-Imidazole (CA INDEX NAME)

RN 9002-98-6 HCAPLUS
CN Aziridine, homopolymer (CA INDEX NAME)

CM 1

CRN 151-56-4
CMF C2 H5 N

RN 9003-47-8 HCAPLUS
CN Pyridine, ethenyl-, homopolymer (CA INDEX NAME)

CM 1

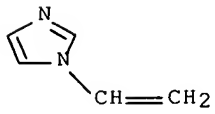
CRN 1337-81-1
CMF C7 H7 N
CCI IDS

D1—CH═CH2

RN 25232-42-2 HCAPLUS
CN 1H-Imidazole, 1-ethenyl-, homopolymer (CA INDEX NAME)

CM 1

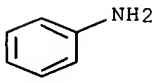
CRN 1072-63-5
CMF C5 H6 N2



RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (CA INDEX NAME)

CM 1

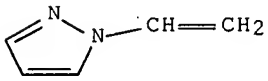
CRN 62-53-3
CMF C6 H7 N



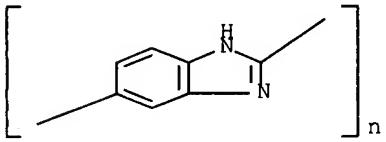
RN 25823-41-0 HCAPLUS
CN 1H-Pyrazole, 1-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 20173-98-2
CMF C5 H6 N2



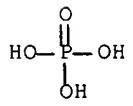
RN 32109-42-5 HCAPLUS
CN Poly(1H-benzimidazole-2,5-diyl) (CA INDEX NAME)



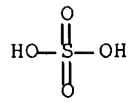
RN 50641-39-9 HCAPLUS
CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diylphenylene) (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 131714-35-7 HCAPLUS
CN Poly[(1,5-dihydrobenzo[1,2-d:4,5-d']diimidazole-2,6-diyl)phenylene] (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
RL: MOA (Modifier or additive use); USES (Uses)
(proton conductive solid polymer electrolyte for electrochem. cell)
RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M006-18; C08G073-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
ST electrochem cell **proton conductive solid polymer electrolyte**; fuel cell **proton conductive solid polymer electrolyte**; **electrolyzer proton conductive solid polymer electrolyte**
IT Azines
RL: DEV (Device component use); USES (Uses)
(diazine; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Heterocyclic compounds
RL: DEV (Device component use); USES (Uses)
(nitrogen; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Electrochemical cells
Electrolytic cells
Fuel cell **electrolytes**
Solid **electrolytes**
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT Polybenzimidazoles
RL: DEV (Device component use); USES (Uses)
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT Ionic **conductivity**
(**proton; proton conductive solid polymer electrolyte** for electrochem. cell)
IT Fuel cells
(solid **electrolyte; proton conductive solid polymer electrolyte** for electrochem. cell)
IT 7732-18-5, Water, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**electrolysis; proton conductive solid polymer electrolyte** for

electrochem. cell)

IT **91-22-5**, Quinoline, uses **110-86-1**, Pyridine, uses **119-65-3**, IsoQuinoline **120-72-9**, Indole, uses **120-73-0**, Purine **288-13-1**, Pyrazole **288-32-4**, Imidazole, uses **9002-98-6** **9003-47-8**, Polyvinylpyridine **25232-42-2**, Polyvinylimidazole **25233-30-1** **25823-41-0**, Poly(1-vinylpyrazole) **32109-42-5**, Poly(1H-benzimidazole-2,5-diyl) **50641-39-9** **131714-35-7**
RL: DEV (Device component use); USES (Uses)
(**proton conductive solid polymer electrolyte** for electrochem. cell)

IT **7664-38-2**, **Phosphoric acid**, uses **7664-93-9**, **Sulfuric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**proton conductive solid polymer electrolyte** for electrochem. cell)

IT 1333-74-0P, **Hydrogen**, preparation 7782-44-7P, Oxygen, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(**proton conductive solid polymer electrolyte** for electrochem. cell)

L36 ANSWER 4 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:242658 HCAPLUS Full-text
DOCUMENT NUMBER: 138:257917
TITLE: Membrane-electrode laminate, its manufacturing method, and **solid polymer** fuel cell using the laminate
INVENTOR(S): Nishikawa, Osamu; Nomura, Shigeki; Nakamura, Masanori; Sugimoto, Toshiya
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: PCT Int. Appl., 75 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003026051	A1	20030327	WO 2002-JP9144	20020909
W: CA, CN, JP, KR, US RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
JP 2003178770	A	20030627	JP 2002-377330	20010927
CA 2428131	A1	20030327	CA 2002-2428131	20020909
EP 1427043	A1	20040609	EP 2002-760815	20020909
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR, BG, CZ, EE, SK				
CN 1537340	A	20041013	CN 2002-802856	

				200209 09
US 2004053113	A1	20040318	US 2003-415891	200309 09
PRIORITY APPLN. INFO.:			JP 2001-275259 A	200109 11
			JP 2001-298030 A	200109 27
			JP 2001-303239 A	200109 28
			WO 2002-JP9144 W	200209 09

AB The laminate has a gas diffusion electrode bonded on both sides of a **proton conductive** membrane; where the binding part of the laminate contains a metal-O bond-containing tridimensionally crosslinked structure formed by a sol-gel reaction ; and is prepared by applying a liquid comprising (1) a Si containing crosslinking monomer or (2) a Si containing crosslinking monomer and a noble metal catalyst supported carbon fine particles on at least 1 side of the membrane; pasting (1) a catalyst supported gas diffusion electrode or (2) a gas diffusion electrode on the liquid, and curing the liquid Preferably, the tridimensionally crosslinked structure contains a **proton conductive** additive which is an **inorg. acid.**

IC ICM H01M008-02
ICS H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST fuel cell **electrolyte proton conductive** crosslinked membrane laminate manuf

IT Fuel cell **electrolytes**
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and **inorg. acids** for fuel cells)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and **inorg. acids** for fuel cells)

IT 11099-06-2P, Polytetraethoxysilane 25930-91-0P, Polymethyltriethoxysilane 503065-09-6P 503065-10-9P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and **inorg. acids** for fuel cells)

IT 78-10-4, Tetraethoxysilane 2031-67-6, Methyltriethoxysilane 52217-60-4, 1,8-Bis(triethoxysilyl)octane 70942-24-4
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and **inorg. acids** for fuel cells)

IT 11104-88-4, Phosphomolybdic acid 12067-99-1, Tungstophosphoric acid

RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and **inorg. acids** for fuel cells)

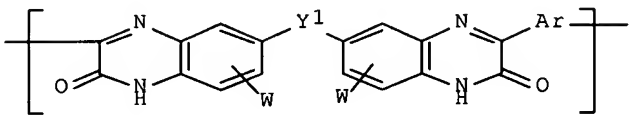
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 5 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:217361 HCAPLUS Full-text
DOCUMENT NUMBER: 134:253338
TITLE: **Solid polymer electrolytes** with excellent moldability and **proton conductivity**, their manufacture, and electrochemical devices therefrom
INVENTOR(S): Uejima, Koichi
PATENT ASSIGNEE(S): Hitachi Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001081295	A	20010327	JP 1999-261388	19990916

PRIORITY APPLN. INFO.: JP 1999-261388 19990916

GI

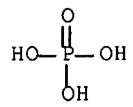


I

AB The **electrolytes**, useful for batteries, fuel cells, and condensers, contain polymers having units (Y1 = direct bond, divalent group; W = H, SO3H; Ar = arylene, pyridinediyl) and **inorg. acids**, organic **acids**, or their salts. Thus, an N-methylpyrrolidone solution containing 10% I (Y1 = direct bond; W = H; Ar = 1,4-phenylene) was applied to an Al plate, dried, immersed in aqueous H2SO4 solution, and dried to give a film with **proton conductivity** -3.2 and -2.2, at 20° and 60°, resp.

IT **7664-38-2, Phosphoric acid**, uses
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of solid **electrolytes** containing quinoxalinone-based **polymers** and acids for electrochem. devices)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



IC ICM C08L065-00
ICS C08K003-24; C08K005-09; G01N027-406; H01B001-06; H01B013-00; H01G009-028; H01M006-18; H01M008-02; H01M010-40
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76
ST **proton cond** heterocyclic **polymer** **solid electrolyte**; quinoxalinone polymer **phosphoric acid** film manuf; ion cond electrochem device condenser battery
IT Electric apparatus
(electrochem.; manufacture of solid **electrolytes** containing quinoxalinone-based **polymers** and acids for electrochem. devices)
IT Solid **electrolytes**
(manufacture of solid **electrolytes** containing quinoxalinone-based **polymers** and acids for electrochem. devices)
IT **7664-38-2, Phosphoric acid,** uses
26545-36-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of solid **electrolytes** containing quinoxalinone-based **polymers** and acids for electrochem. devices)

L36 ANSWER 6 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:217360 HCAPLUS Full-text
DOCUMENT NUMBER: 134:253337
TITLE: **Solid polymer** **electrolytes** with excellent moldability, their manufacture, and electrochemical devices therefrom
INVENTOR(S): Ueshima, Koichi; Tai, Seiji
PATENT ASSIGNEE(S): Hitachi Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001081293	A	20010327	JP 1999-260199	199909 14

PRIORITY APPLN. INFO.: JP 1999-260199

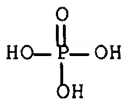
199909
14

AB The **electrolytes**, useful for batteries, fuel cells, and condensers, contain polymers having units ArQ (Ar = C6-14 arylene; Q = divalent group from C1-20 alkyl- or C6-14 aryl-substituted 5-membered heterocycle containing N and optionally O and S) and **inorg. acids**, organic **acids**, or their salts. Thus, an N-methylpyrrolidone solution containing 10% poly(2,5-oxazolediyl-1,4-phenylene) was applied to an Al plate, dried, immersed in aqueous **H2SO4** solution, and dried to give a film with **proton conductivity** -3.2 and -2.4, at 20° and 60°, resp.

IT **7664-38-2, Phosphoric acid**, uses
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of solid **electrolytes** containing heterocyclic **polymers** and acids for electrochem. devices)

RN 7664-38-2 HCAPLUS

CN Phosphoric acid (CA INDEX NAME)



IC ICM C08L065-00
ICS C08K003-24; C08K003-30; C08K003-32; C08K005-41; C08K005-521; G01N027-333; H01B001-06; H01G009-028; H01M006-18; H01M008-02; H01M010-40; C08G061-12

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76

ST **proton cond** heterocyclic **polymer** **solid electrolyte**; polyoxazolediylphenylene **phosphoric acid** film manuf battery; moldability **solid polymer electrolyte** electrochem device

IT Electric apparatus
(electrochem.; manufacture of solid **electrolytes** containing heterocyclic **polymers** and acids for electrochem. devices)

IT Solid **electrolytes**
(manufacture of solid **electrolytes** containing heterocyclic **polymers** and acids for electrochem. devices)

IT **7664-38-2, Phosphoric acid**, uses
331256-79-2, Poly(2,5-oxazolediyl-1,4-phenylene)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of solid **electrolytes** containing heterocyclic **polymers** and acids for electrochem. devices)

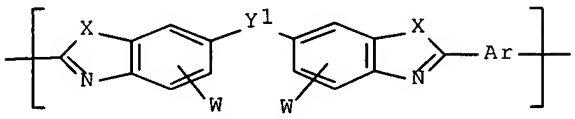
L36 ANSWER 7 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:214978 HCAPLUS Full-text
DOCUMENT NUMBER: 134:253302
TITLE: **Solid polymer electrolytes** with high **proton conductivity**, their manufacture, and electrochemical devices therefrom

INVENTOR(S): Ueshima, Koichi; Tai, Seiji
PATENT ASSIGNEE(S): Hitachi Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001081294	A	20010327	JP 1999-261386	199909 16

PRIORITY APPLN. INFO.: JP 1999-261386 199909 16

GI

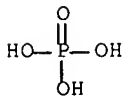


I

AB The **electrolytes**, useful for batteries, fuel cells, and condensers, contain polymers having units I (X = substituted N, NH, O, S; Y1 = direct bond, divalent group; W = H, SO3H; Ar = arylene, pyridinediyl) and **inorg. acids**, organic **acids**, or their salts. Thus, an N-methylpyrrolidone solution containing 10% I (X = O; Y1 = direct bond; Ar = 1,3-phenylene) was applied to an Al plate, dried, immersed in aqueous **H2SO4** solution, and dried to give a film with **proton cond** . -3.0 and -2.0, at 20° and 60°, resp.

IT **7664-38-2, Phosphoric acid**, uses
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of solid **electrolytes** containing heterocyclic **polymers** and acids for electrochem. devices with high **proton conductivity**)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



IC ICM C08L065-00
ICS C08K003-24; C08K005-09; G01N027-409; H01B001-06; H01B013-00;

H01G009-028; H01M006-18; H01M008-02; H01M010-40
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76
ST **proton cond** heterocyclic **polymer** **solid electrolyte**; benzoxazole polymer **phosphoric acid** film manuf; ion cond electrochem device condenser battery
IT Electric apparatus
(electrochem.; manufacture of solid **electrolytes** containing heterocyclic **polymers** and acids for electrochem. devices with high **proton conductivity**)
IT Solid **electrolytes**
(manufacture of solid **electrolytes** containing heterocyclic **polymers** and acids for electrochem. devices with high **proton conductivity**)
IT **7664-38-2, Phosphoric acid**, uses
25868-25-1
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of solid **electrolytes** containing heterocyclic **polymers** and acids for electrochem. devices with high **proton conductivity**)

L36 ANSWER 8 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:207937 HCAPLUS Full-text
DOCUMENT NUMBER: 134:238596
TITLE: **Proton conducting** polymer, method for producing the same, **solid polymer electrolyte** and electrode
INVENTOR(S): Akita, Hiroshi; Ichikawa, Masao; Iguchi, Masaru; Oyanagi, Hiroyuki
PATENT ASSIGNEE(S): Honda Giken Kogyo Kabushiki Kaisha, Japan
SOURCE: Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

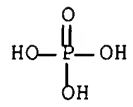
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1085034	A1	20010321	EP 2000-120490	200009 19
EP 1085034	B1	20051228		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2001160407	A	20010612	JP 2000-268735	200009 05
US 6478987	B1	20021112	US 2000-664089	200009 18
US 2002185631	A1	20021212	US 2002-193060	200207 11
US 6767664	B2	20040727		

US 2003001143	A1	20030102	US 2002-193047	200207 11
US 6770393	B2	20040803		
PRIORITY APPLN. INFO.:			JP 1999-265113	A 199909 20
			US 2000-664089	A3 200009 18

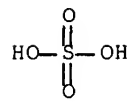
AB A **proton conducting** polymer is obtained by blending a strong acid solution with a meta type polyaniline solution;. A **solid polymer electrolyte** for a fuel cell comprises the **proton conducting** polymer. The conducting polymer is excellent in **proton cond** ., methanol barrier property and dopant stability in an aqueous solution of methanol. An electrode comprises the **proton conducting** polymer and fine catalyst particles carried on porous particles.

IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuricacid, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**proton conducting** polymer, method for producing the same, **solid polymer electrolyte** and electrode)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)

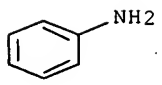


IT **25233-30-1**, Polyaniline
RL: PRP (Properties)
(**proton conducting** polymer, method for producing the same, **solid polymer electrolyte** and electrode)

RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IC ICM C08G073-02
ICS H01B001-12; H01M008-10; H01G009-02
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76
ST **proton conducting** polyaniline strong acid dopant
IT Electrodes
(**proton conducting** polymer, method for producing the same, **solid polymer electrolyte** and electrode)
IT Polyanilines
RL: PRP (Properties)
(**proton conducting** polymer, method for producing the same, **solid polymer electrolyte** and electrode)
IT **Conducting** polymers
(**proton-conducting; proton conducting** polymer, method for producing the same, **solid polymer electrolyte** and electrode)
IT Polyelectrolytes
(**solid; proton conducting polymer**, method for producing the same, **solid polymer electrolyte** and electrode)
IT 838-85-7 **7664-38-2, Phosphoric acid,** uses **7664-93-9,** Sulfuricacid, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**proton conducting** polymer, method for producing the same, **solid polymer electrolyte** and electrode)
IT **25233-30-1,** Polyaniline
RL: PRP (Properties)
(**proton conducting** polymer, method for producing the same, **solid polymer electrolyte** and electrode)
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 9 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1998:693672 HCAPLUS Full-text
DOCUMENT NUMBER: 130:27248
TITLE: Secondary batteries, **proton-conducting polymer electrolytes,** and electrode active mass
INVENTOR(S): Takeuchi, Masataka; Ookubo, Takashi
PATENT ASSIGNEE(S): Showa Denko K. K., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10289617	A	19981027	JP 1997-97435	199704 15
PRIORITY APPLN. INFO.:			JP 1997-97435	199704 15

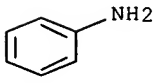
AB Claimed secondary batteries use **proton-conducting polymer solid electrolytes**. Claimed **electrolytes** contain protonic acids and are obtained from compds. having polymerizing functional group CH2:C(R1)CO2 or CH2C(R2)CO(OR3)xNHCO2 (R1, R2 = H or alkyl; R3 = C<10 divalent group; x = 0-10) by polymerization using heat and/or active light. Claimed electrodes use composites of active mass selected from polymers having sulfonic acid side chains, polymers containing polypyridine, polypyrimidine, and/or polyquinone in the backbone, or Mn oxides with the above **polymer electrolytes**. The batteries have high safety, reliability, large capacity, and long cycle life.

IT **25233-30-1DP**, Polyaniline, sulfonated **25233-30-1P**, Polyaniline
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(composites with **polymer electrolytes**, electrodes; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (CA INDEX NAME)

CM 1

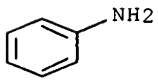
CRN 62-53-3
CMF C6 H7 N



RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N

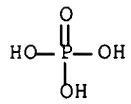


IT **7664-38-2, Phosphoric acid**, uses
RL: DEV (Device component use); USES (Uses)

(**electrolytes** containing; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

RN 7664-38-2 HCAPLUS

CN Phosphoric acid (CA INDEX NAME)



IC ICM H01B001-12
ICS C08F020-00; C08G018-06; C08G061-02; C08G073-00; C08L075-00; H01M004-02; H01M004-50; H01M004-60; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76

ST **proton conducting polymer electrolyte** battery safety; composite electrode **polymer electrolyte**; photopolymn **proton conducting polymer electrolyte**; urethane acrylic polyoxyalkylene **electrolyte** battery

IT Battery electrodes
Battery **electrolytes**
Conducting polymers
Secondary batteries
(batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Polyamines
Polyanilines
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(composites with **polymer electrolytes**, electrodes; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Acids, uses
Sulfonic acids, uses
RL: DEV (Device component use); USES (Uses)
(**electrolytes** containing; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Urethanes
RL: DEV (Device component use); USES (Uses)
(**electrolytes**; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Polyoxyalkylenes, uses
Polyoxyalkylenes, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(fluorine-containing, **electrolytes**; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(fluorine-containing, perfluoro, acrylic, **electrolytes**; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Safety
(in manufacture of **proton-conducting polymer electrolytes** for batteries)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(perfluoro, perfluoro, acrylic, **electrolytes**; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Ionic conductors
(polymeric; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Sulfonic acids, uses
Sulfonic acids, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(**polymers**, composites with **polymer electrolytes**, electrodes; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Fluoropolymers, uses
Fluoropolymers, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(polyoxyalkylene-, **electrolytes**; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Fluoropolymers, uses
Fluoropolymers, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(polyoxyalkylene-, perfluoro, acrylic, **electrolytes**; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT Polymers, uses
Polymers, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(sulfo-containing, composites with **polymer electrolytes**, electrodes; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT 25013-01-8, Polypyridine 71730-08-0
RL: DEV (Device component use); USES (Uses)
(composites with **polymer electrolytes**, electrodes; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT 7446-11-9DP, Sulfuric anhydride, reaction products with polyaniline
11129-60-5P, Manganese oxide **25233-30-1DP**, Polyaniline, sulfonated **25233-30-1P**, Polyaniline 26745-90-4P
190201-51-5P, Pyrimidine **homopolymer**
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(composites with **polymer electrolytes**, electrodes; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT 104-15-4, uses **7664-38-2, Phosphoric acid**, uses
RL: DEV (Device component use); USES (Uses)
(**electrolytes** containing; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT 202739-72-8P
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(**electrolytes**; batteries using **proton-conducting polymer electrolytes** and **polymer** composite electrodes)

IT 76287-91-7P 87260-75-1P 203391-79-1DP, reaction products with polyoxyalkylenes, fluorine-containing
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(preparation of; in manufacture of **proton-conducting polymer electrolytes** for batteries)

IT 30674-80-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, urethane compds. from; in manufacture of **proton-conducting polymer electrolytes** for batteries)

IT 25791-96-2
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with methacryloyloxyethyl isocyanate; in manufacture of **proton-conducting polymer electrolytes** for batteries)

IT 375-01-9, 2,2,3,3,4,4,4-Heptafluoro-1-butanol 37286-64-9, Polyoxypropylene monomethyl ether 107852-51-7, Fomblin Z-DOL
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with methacryloyloxyethylisocyanate; in manufacture of **proton-conducting polymer electrolytes** for batteries)

L36 ANSWER 10 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:371660 HCAPLUS Full-text
DOCUMENT NUMBER: 127:18475
TITLE: **Proton-conductive polymer solid electrolytes**
INVENTOR(S): Bessho, Keiichi; Teramoto, Toshio; Ishikawa, Katsuhiro
PATENT ASSIGNEE(S): Japan Synthetic Rubber Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

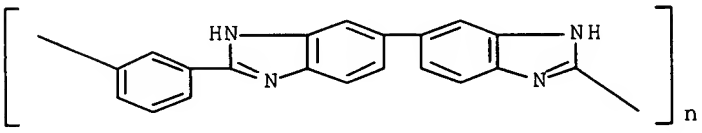
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09087510	A	19970331	JP 1995-268064	199509

PRIORITY APPLN. INFO.: JP 1995-268064 22
199509
22

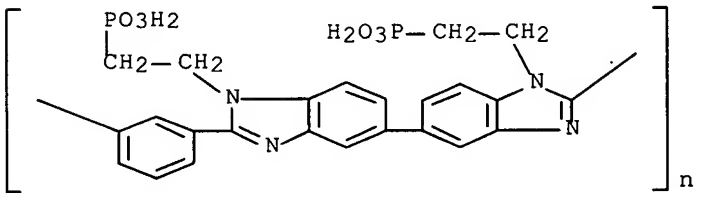
AB The title **electrolytes**, useful for primary, secondary, and fuel batteries, display devices, sensors, capacitors, ion-exchange membranes, etc. (no data), are prepared from (a) introducing sulfone or phosphoric group to aromatic or N-containing ring polymers with heat resistance >250° [e.g., reaction product of (O-p-C6H4-p-C6H4-CO2-p-C6H4)n and **H2SO4**] and (b) polymer with **proton conductivity** at relative humidity 50% 10-5 s/cm, polymer with water absorptivity >1%, and/or polymer with glass transition temperature <0° [e.g., polyoxyethylene, polyethyleneimine, poly(vinyl alc.)].

IT **25734-65-0DP**, reaction product with 1,3-propanesultone
189640-60-6DP, reaction product with 1,3-propanesultone
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**proton-conductive polymer**
solid electrolytes)

RN 25734-65-0 HCAPLUS
CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene) (CA INDEX NAME)



RN 189640-60-6 HCAPLUS
CN Poly[[1,1'-bis(2-phosphonoethyl)[5,5'-bi-1H-benzimidazole]-2,2'-diyl]-1,3-phenylene] (9CI) (CA INDEX NAME)



IT **9002-98-6**
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(**proton-conductive polymer**
solid electrolytes)

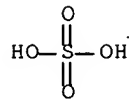
RN 9002-98-6 HCAPLUS
CN Aziridine, homopolymer (CA INDEX NAME)

CM 1

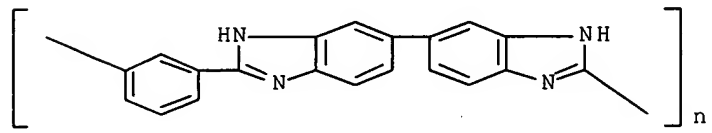
CRN 151-56-4

CMF C2 H5 N

IT **7664-93-9, Sulfuric acid**, reactions
25734-65-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(**proton-conductive polymer solid electrolytes**)
RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)



RN 25734-65-0 HCAPLUS
CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene) (CA INDEX NAME)



IC ICM C08L071-00
ICS C08L065-00; G01N027-406; H01G009-028; H01M006-18; H01M008-02; H01M010-40
CC 37-6 (Plastics Manufacture and Processing)
ST **proton conductive polymer solid electrolyte**; sulfonated polyoxyphenylene polycarbonate **proton conductor**; polyoxyethylene **proton conductive** solid **electrolyte**; polyethyleneimine **proton conductive** solid **electrolyte**; polyvinyl alc **proton conductive** solid **electrolyte**
IT **Conducting** polymers
(ionic; **proton-conductive polymer solid electrolytes**)
IT Polyoxyphenylenes
Polyoxyphenylenes
RL: RCT (Reactant); RACT (Reactant or reagent)
(polyester-; **proton-conductive polymer solid electrolytes**)
IT Polyesters, reactions
Polyesters, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)

(polyoxyphenylene-; **proton-conductive polymer solid electrolytes**)

IT Sulfonation
(**proton-conductive polymer solid electrolytes**)

IT Polyamines
Polyoxyalkylenes, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(**proton-conductive polymer solid electrolytes**)

IT Polybenzimidazoles
RL: RCT (Reactant); RACT (Reactant or reagent)
(**proton-conductive polymer solid electrolytes**)

IT **25734-65-0DP**, reaction product with 1,3-propanesultone
189640-60-6DP, reaction product with 1,3-propanesultone
189768-11-4DP, reaction product with **sulfuric acid**
189768-12-5DP, reaction product with **sulfuric acid**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**proton-conductive polymer solid electrolytes**)

IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6** 25322-68-3
26913-06-4, Poly[imino(1,2-ethanediyl)]
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(**proton-conductive polymer solid electrolytes**)

IT 1120-71-4D, 1,3-Propanesultone, reaction products with polybenzimidazoles **7664-93-9, Sulfuric acid**, reactions 16672-87-0 **25734-65-0**
91442-06-7 189768-12-5
RL: RCT (Reactant); RACT (Reactant or reagent)
(**proton-conductive polymer solid electrolytes**)

L36 ANSWER 11 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:353281 HCAPLUS Full-text
DOCUMENT NUMBER: 127:18459
TITLE: **Proton conductive polymeric solid electrolyte** compositions and films and their production
INVENTOR(S): Betsusho, Keiichi; Teramoto, Toshio; Ishikawa, Katsuhiro
PATENT ASSIGNEE(S): Japan Synthetic Rubber Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09087369	A	19970331	JP 1995-268065	199509

22

JP 3765116 B2 20060412

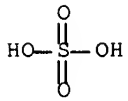
PRIORITY APPLN. INFO.: JP 1995-268065 199509 22

AB Title composition comprises (A) a polymer having nitrogen-containing ring structure and heat-resistant temperature >250°; (B) ≥1 polymers chosen from (i) polymer with **proton cond** . 10-5 (S/cm) at relative humidity 50%, (ii) polymer with water absorption rate >1%, and (iii) polymer with glass transition temperature <0°; and (C) **inorg. acid** and/or organic acid. Thus, a **proton conductive polymeric solid electrolyte** film prepared by mixing pyridine group-containing polymer (A) 70 with polyoxyethylene 30 and **sulfuric acid** (N mol. number in A: **H2SO4** = 1:0.5) in a solvent then casting the solution on Pt had **proton conductivity** 2 + 10-2 S/cm at 20° and good adhesion with Pt electrode.

IT **7664-93-9, Sulfuric acid,** uses
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(preparation of **proton conductive polymeric solid electrolyte** compns. and films)

RN 7664-93-9 HCAPLUS

CN Sulfuric acid (CA INDEX NAME)



IT **9002-98-6**
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(preparation of **proton conductive polymeric solid electrolyte** compns. and films)

RN 9002-98-6 HCAPLUS

CN Aziridine, homopolymer (CA INDEX NAME)

CM 1

CRN 151-56-4
CMF C2 H5 N

IC ICM C08G061-10
ICS C08K003-24; C08K005-09; C08L065-00; C08L101-00; H01M010-40

CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 76

ST **solid polymer electrolyte** compn **proton cond**; pyridine **polymer**

polyoxyethylene **electrolyte** compn cond; **sulfuric acid** pyridine polymer polyoxyethylene compn

IT Polyethers, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(aromatic, fluorine-containing; preparation of **proton conductive polymeric solid electrolyte** compns. and films)

IT Polyethers, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(fluorine-containing, aromatic; preparation of **proton conductive polymeric solid electrolyte** compns. and films)

IT Adhesion, physical
(of **proton conductive polymeric solid electrolyte** compns. film with Pt electrode)

IT Fluoropolymers, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyether-, aromatic; preparation of **proton conductive polymeric solid electrolyte** compns. and films)

IT Electric **conductivity**
(preparation of **proton conductive polymeric solid electrolyte** compns. and films)

IT Polyoxyalkylenes, properties
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(preparation of **proton conductive polymeric solid electrolyte** compns. and films)

IT Polyphenyls
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(preparation of **proton conductive polymeric solid electrolyte** compns. and films)

IT **7664-93-9, Sulfuric acid**, uses
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(preparation of **proton conductive polymeric solid electrolyte** compns. and films)

IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6** 25322-68-3
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(preparation of **proton conductive polymeric solid electrolyte** compns. and films)

IT 142084-73-9 190914-38-6, Poly[2-(2-benzoxazolyl)-1,4-phenylene]
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(preparation of **proton conductive polymeric solid electrolyte** compns. and films)

L36 ANSWER 12 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:27087 HCAPLUS Full-text
DOCUMENT NUMBER: 126:92127
TITLE: Electrochemical capacitor having symmetric inorganic electrodes
INVENTOR(S): Lian, Ke K.; Li, Changming; Jung, Richard H.; Kincs, Joseph G.
PATENT ASSIGNEE(S): Motorola, Inc., USA
SOURCE: U.S., 7 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

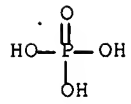
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5587872	A	19961224	US 1995-547821	19951025
CA 2235132	A1	19970501	CA 1996-2235132	19961017
WO 9715938	A1	19970501	WO 1996-US16644	19961017
W: CA, CN, JP, KR RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
CN 1220027	A	19990616	CN 1996-197860	19961017
CN 1127101	B	20031105		
JP 2001518234	T	20011009	JP 1997-516662	19961017

PRIORITY APPLN. INFO.:		
US 1995-547821	A	19951025
WO 1996-US16644	W	19961017

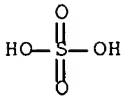
AB An electrochem. capacitor is fabricated by providing 2 sym. electrodes and a **solid polymer electrolyte** between them. The sym. electrodes, anode and cathode, are made from materials such as Ru, Ir, Co, Zn, Bi, Cd, Ag, and their oxides. The **solid polymer electrolyte** is in intimate contact with both the anode and cathode, and is made from a polymeric support structure such as poly(vinyl alc.), having a **proton-conducting electrolyte** active species dispersed in it.

IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
9002-98-6
RL: DEV (Device component use); USES (Uses)
(**electrolytic** capacitors having sym. inorg. electrodes containing)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)



RN 9002-98-6 HCAPLUS
CN Aziridine, homopolymer (CA INDEX NAME)

CM 1

CRN 151-56-4
CMF C2 H5 N

IC ICM H01G009-02
INCL 361525000
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72, 76
IT Oxides (inorganic), uses
Polymer electrolytes
Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(**electrolytic** capacitors having sym. inorg. electrodes containing)
IT **Electrolytic** capacitors
(having sym. inorg. electrodes)
IT 1317-37-9, Iron sulfide (FeS) 7439-88-5, Iridium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-43-9, Cadmium, uses 7440-44-0, Carbon, uses 7440-48-4, Cobalt, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses **7664-38-2**, **Phosphoric acid**, uses **7664-93-9**, **Sulfuric acid**, uses 9002-89-5, Polyvinyl alcohol **9002-98-6** 9003-05-8, Polyacrylamide 9003-20-7, Polyvinyl acetate 9003-39-8, Poly(vinyl pyrrolidone) 12033-31-7, Molybdenum nitride (Mo2N) 12036-10-1, Ruthenium oxide (RuO2) 25014-15-7, Poly(2-vinylpyridine) 25232-41-1, Poly(4-vinylpyridine) 25322-68-3
RL: DEV (Device component use); USES (Uses)
(**electrolytic** capacitors having sym. inorg. electrodes

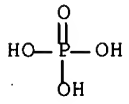
containing)

L36 ANSWER 13 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:541717 HCAPLUS Full-text
DOCUMENT NUMBER: 125:223262
TITLE: Enhanced ionic conductivity of poly(ethyleneimine) phosphate
AUTHOR(S): Senadeera, G. K. R.; Careem, M. A.; Skaarup, S.; West, K.
CORPORATE SOURCE: Department of Physics, University of Peradeniya, Peradeniya, Sri Lanka
SOURCE: Solid State Ionics (1996), 85(1-4), 37-41
CODEN: SSIOD3; ISSN: 0167-2738
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The conductivity of mixts. of **phosphoric acid** with poly(ethyleneimine) has been studied; the conductivity of such mixts. with high acid content can be enhanced by the addition of highly dispersed silica (fumed silica). At the same time, silica addition increases the stiffness of the **polymer**, and macroscopically **solid** composites with good **proton conductivity** can be obtained, without significant degradation of the optical transparency of the **polymer electrolyte**.

IT **7664-38-2, Phosphoric acid**, properties
9002-98-6, Aziridine polymer
RL: PRP (Properties)
(enhanced ionic conductivity of poly(ethyleneimine) phosphate via addition of silica)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



RN 9002-98-6 HCAPLUS
CN Aziridine, homopolymer (CA INDEX NAME)

CM 1

CRN 151-56-4
CMF C2 H5 N

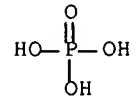
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 76

IT **7664-38-2, Phosphoric acid**, properties
9002-98-6, Aziridine polymer
RL: PRP (Properties)
(enhanced ionic conductivity of poly(ethyleneimine) phosphate via addition of silica)

L36 ANSWER 14 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1990:640006 HCAPLUS Full-text
DOCUMENT NUMBER: 113:240006
TITLE: Characterization of a "solid-state" microelectrochemical diode employing a poly(vinyl alcohol)/**phosphoric acid** solid-state **electrolyte**: rectification at Junctions between tungsten trioxide (WO3) and polyaniline
AUTHOR(S): Leventis, Nicholas; Schloh, Martin O.; Natan, Michael J.; Hickman, James J.; Wrighton, Mark S.
CORPORATE SOURCE: Dep. Chem., Massachusetts Inst. Technol., Cambridge, MA, 02139, USA
SOURCE: Chemistry of Materials (1990), 2(5), 568-76
CODEN: CMATEX; ISSN: 0897-4756
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The functionalization of an array of eight, closely spaced (.apprx.1.2 μm) Pt or Au microelectrodes each .apprx.50 μm long, 2 μm wide, and 0.1 μm thick with redox-active WO3 and polyaniline and the electrochem. characterization of the WO3/polyaniline junction are reported. Chips consisting of microfabricated WO3 covering three of the available eight microelectrodes have been analyzed by Auger electron spectroscopy. The remaining five microelectrodes are available for further derivatization with polyaniline or can function as counterelectrodes. By placing a counterelectrode and a Ag quasi-reference electrode directly on the microchip and by coating the assembly with a thin film of poly(vinyl alc.)/**H3PO4 solid polymeric electrolyte**, the electrochem. system becomes self-contained. The **solid polymer electrolyte** is a good room-temperature **H** + **conductor** only when exposed to a H2O-containing atmospheric Complex impedance studies show as much as a 103 change in **H** + **conductivity** from H2O-saturated to H2O-free gaseous atmospheric above the **polymer electrolyte**. The changes in conductivity of WO3 upon reduction or polyaniline upon oxidation allow demonstration of solid-state microelectrochem. transistors with these materials. The combination of WO3 and polyaniline on the chip allows demonstration of the microelectrochem. diode.

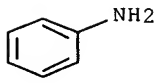
IT **7664-38-2, Phosphoric acid**, uses and miscellaneous
RL: USES (Uses)
(**electrolyte** with poly(vinyl alc.) and, in functionalization of gold or platinum electrode with tungsten oxide and polyaniline)
RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



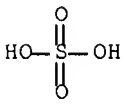
IT **25233-30-1**, Polyaniline
RL: PRP (Properties)
(functionalization of gold or platinum electrodes with tungsten oxide and)
RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IT **7664-93-9, Sulfuric acid**, uses and miscellaneous
RL: USES (Uses)
(polymerization of aniline in solution containing, for modification of electrodes with conducting polymers and tungsten oxide)
RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 36, 76
ST platinum gold array microelectrode functionalization; tungsten trioxide polyaniline electrode functionalization; polyvinyl alc **phosphoric acid polymeric electrolyte; proton conductor** water atm; cond elec redn oxidn electrochem; diode transistor electrochem
IT Electric conductivity and conduction
(in polyaniline-tungsten oxide system with **solid polymer electrolyte**)
IT Electric impedance
(of polyaniline-tungsten oxide system with **polymer electrolyte**)
IT Electric conductors
(poly(vinyl alc.)-**phosphoric acid** system)
IT 12408-02-5, **Hydrogen** ion, properties
RL: PRP (Properties)
(**conductivity** of, in tungsten oxide-polyaniline modification on platinum or gold electrodes, water effect on)
IT 9002-89-5
RL: PRP (Properties)
(**electrolyte** with **phosphoric acid** and, in functionalization of gold or platinum electrode with tungsten oxide and polyaniline)
IT **7664-38-2, Phosphoric acid**, uses and miscellaneous
RL: USES (Uses)
(**electrolyte** with poly(vinyl alc.) and, in functionalization of gold or platinum electrode with tungsten oxide and polyaniline)

IT **25233-30-1**, Polyaniline
RL: PRP (Properties)
(functionalization of gold or platinum electrodes with tungsten oxide and)
IT **7664-93-9**, **Sulfuric acid**, uses and miscellaneous **7681-38-1**, Sodium hydrogen sulfate
RL: USES (Uses)
(polymerization of aniline in solution containing, for modification of electrodes with conducting polymers and tungsten oxide)

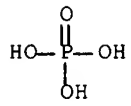
L36 ANSWER 15 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1987:462049 HCAPLUS Full-text
DOCUMENT NUMBER: 107:62049
TITLE: Electrochemical method and apparatus using **proton-conducting** polymers
INVENTOR(S): Zupancic, Joseph J.; Swedo, Raymond J.; Petty-Weeks, Sandra L.
PATENT ASSIGNEE(S): UOP Inc., USA
SOURCE: U.S., 10 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4664761	A	19870512	US 1985-814339	198512 27
PRIORITY APPLN. INFO.:			US 1985-814339	198512 27

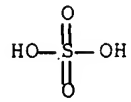
AB An interpenetrating polymer-network membrane for use as solid **electrolyte** in fuel cells or separation of H from gas mixture or other electrochem. processes involving H+ contains a host polymer blend of **H3PO4** or **H2SO4** mixed with a polymer or copolymer of ethyleneimine, acrylic acid, ethylene oxide, 2-ethyl-2-oxazoline, acrylamide, N-substituted acrylamide, 4-vinylpyridine, methacrylic acid, N-vinylimidazole, vinylsulfonic acid, 2-vinylpyridine, poly(hydroxyethylene), or PhOH-HCHO resin and a guest polymer of acrylic acid, methacrylic acid, acrylamide, methacrylamide, 2-acrylamido-2-methylpropanesulfonic acid, N-benzylacrylamide, N-ethylmethylacrylamide, N-phenylacrylamide, or N-phenylmethacrylamide crosslinked by methylenebisacrylamide, N,N-diallylacryllamide, m-xylenebisacrylamide, or N,N'-trimethylenebisacrylamide where the repeating units of the guest polymer is different from that of the host polymer. The membrane is coated with catalysts on opposite sides and used as partitioner to sep. 2 gas chambers in an apparatus An aqueous solution of **H3PO4** and poly(vinyl alc.) and an aqueous solution of methylenebisacrylamide and methacrylic acid were mixed, poured into a Petri dish, H2O was evaporated, the film was irradiated by a 175-keV electron beam at 5 Mrad/pass from 1 side, cut into a 1"-diameter disk, and sputtered to form 400-Å Pt layers on both sides. This disk had a resistivity of 2 + 106 Ω-cm and a H flux of 1.8 + 10-5 ft3/ft2-h.
IT **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous **9002-98-6 25232-42-2**, Poly(N-vinylimidazole)
RL: USES (Uses)
(**solid electrolytes** containing, **proton-**

conductive, for fuel cells and other electrochem. app)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)



RN 9002-98-6 HCAPLUS
CN Aziridine, homopolymer (CA INDEX NAME)

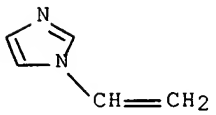
CM 1

CRN 151-56-4
CMF C2 H5 N

RN 25232-42-2 HCAPLUS
CN 1H-Imidazole, 1-ethenyl-, homopolymer (CA INDEX NAME)

CM 1

CRN 1072-63-5
CMF C5 H6 N2



IC ICM C25B001-02
ICS H01M008-10
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 47, 49, 72
ST polyvinyl alc **phosphoric acid**

electrolyte; polymethacrylic acid **solid**
electrolyte; fuel cell **polymer solid**
electrolyte; hydrogen sepn **polymer solid**
electrolyte
IT Fuel cells
(**electrolytes** for, **solid polymer**)
IT 30421-16-0, Methacrylic acid-methylenebisacrylamide **copolymer**
RL: USES (Uses)
(crosslinked, **solid electrolytes** containing, **proton-conductive**, for fuel cells and other electrochem. apparatus)
IT 1333-74-0P, Hydrogen, preparation
RL: PREP (Preparation)
(separation of, from gas mixts. by electrochem. processes, **solid polymer electrolytes** for)
IT **7664-38-2, Phosphoric acid**, uses and miscellaneous **7664-93-9, Sulfuric acid**, uses and miscellaneous 9002-89-5 **9002-98-6** 9003-01-4, Poly(acrylic acid) 9003-05-8 9003-35-4, Formaldehyde phenol **copolymer** 25014-15-7, Poly(2-vinylpyridine) 25087-26-7, Poly(methacrylic acid) 25232-41-1, Poly(4-vinylpyridine) **25232-42-2**, Poly(N-vinylimidazole) 25322-68-3, Poly(ethylene oxide) 25805-17-8, Poly(2-ethyl-2-oxazoline) 26101-52-0, Poly(vinyl sulfonic acid)
RL: USES (Uses)
(**solid electrolytes** containing, **proton-conductive**, for fuel cells and other electrochem. app)

=> d l41 ibib abs hitstr hitind 1-8

L41 ANSWER 1 OF 8 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:875559 HCAPLUS Full-text
DOCUMENT NUMBER: 139:367552
TITLE: Multilayered **electrolyte**-electrode membrane assemblies containing mineral acids, basic polymers, and a cation exchange-type barrier coating
INVENTOR(S): Uensal, Oemer; Kiefer, Joachim
PATENT ASSIGNEE(S): Celanese Ventures GmbH, Germany; Pemeas GmbH
SOURCE: PCT Int. Appl., 49 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

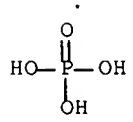
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003092090	A2	20031106	WO 2003-EP4117	200304 22
			<--	
WO 2003092090	A3	20050120		
W: BR, CA, CN, JP, KR, MX, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
DE 10218368	A1	20031106	DE 2002-10218368	

				200204 25
			<--	
DE 10218367	A1	20031113	DE 2002-10218367	200204 25
			<--	
CA 2483015	A1	20031106	CA 2003-2483015	200304 22
			<--	
EP 1518282	A2	20050330	EP 2003-718780	200304 22
			<--	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
CN 1650463	A	20050803	CN 2003-809351	200304 22
			<--	
US 2005181254	A1	20050818	US 2003-512264	200304 22
			<--	
JP 2005527948	T	20050915	JP 2004-500346	200304 22
			<--	
PRIORITY APPLN. INFO.:			DE 2002-10218367 A	200204 25
			<--	
			DE 2002-10218368 A	200204 25
			<--	
			WO 2003-EP4117 W	200304 22

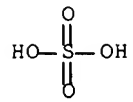
AB **Proton-conducting** multi-layered **electrolyte** membranes for fuel cells are characterized by at least one mineral acid-doped or mineral acid-containing flat surfaces and a barrier layer for the other layer, which, together, make up a membrane electrode assembly. Preferred mineral acids include **H3PO4**, **H2SO4**, and polyphosphoric acids. The barrier layer, which preferably consists of a cation exchanger with cation-exchange capacity <0.9 meq/g and a **proton conductivity** <0.06 S/cm, has a thickness of 10-30 μm (preferably <10 μm). The flat surfaces of the membrane consist of a basic polymer (or a basic polymer integrated with a second polymer or an inert support), selected from polyimidazoles, polybenzimidazoles, polybenzthiazoles, polybenzoxazoles, polytriazoles, polyoxadiazoles, polythiadiazoles, polypyrazoles, polyquinoxalines, polypyridines, polypyrimidines, or poly(tetraazapyrenes). Such multilayer **electrolyte** membranes prevents mineral acid from being washed out and reduces the overvoltage on the cathode.

IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(membrane assembly containing; multilayered **electrolyte** -electrode membrane assemblies containing mineral acids, basic

polymers, and a cation exchange-type barrier coating)
RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)

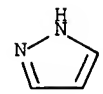


RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)



IT **110-86-1D**, Pyridine, derivs., **polymers**
288-13-1D, Pyrazole, derivs., **polymers**
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(membranes; multilayered **electrolyte**-electrode membrane assemblies containing mineral acids, basic polymers, and a cation exchange-type barrier coating)
RN 110-86-1 HCAPLUS
CN Pyridine (CA INDEX NAME)

RN 288-13-1 HCAPLUS
CN 1H-Pyrazole (CA INDEX NAME)



IC ICM H01M
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST multilayered **electrolyte** electrode membrane fuel cell; basic **polymer electrolyte** electrode membrane fuel cell; polybenzimidazole **electrolyte** electrode membrane fuel cell
IT Polyphosphoric acids
RL: TEM (Technical or engineered material use); USES (Uses)

(membrane assembly containing; multilayered **electrolyte**
-electrode membrane assemblies containing mineral acids, basic
polymers, and a cation exchange-type barrier coating)

IT Polybenzimidazoles
Polybenzothiazoles
Polybenzoxazoles
Polyoxadiazoles
Polyquinoxalines
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(membranes; multilayered **electrolyte**-electrode membrane assemblies containing mineral acids, basic polymers, and a cation exchange-type barrier coating)

IT Fuel cell electrodes
Fuel cell **electrolytes**
Fuel cell separators
(multilayered **electrolyte**-electrode membrane assemblies containing mineral acids, basic polymers, and a cation exchange-type barrier coating)

IT Polysulfones, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(polyether-, membranes; multilayered **electrolyte**
-electrode membrane assemblies containing mineral acids, basic
polymers, and a cation exchange-type barrier coating)

IT Polyketones
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(polyether-, sulfonated, membranes; multilayered **electrolyte**-electrode membrane assemblies containing mineral acids, basic polymers, and a cation exchange-type barrier coating)

IT Polyethers, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(polyketone-, sulfonated, membranes; multilayered **electrolyte**-electrode membrane assemblies containing mineral acids, basic polymers, and a cation exchange-type barrier coating)

IT Polyethers, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(polysulfone-, membranes; multilayered **electrolyte**
-electrode membrane assemblies containing mineral acids, basic
polymers, and a cation exchange-type barrier coating)

IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(membrane assembly containing; multilayered **electrolyte**
-electrode membrane assemblies containing mineral acids, basic
polymers, and a cation exchange-type barrier coating)

IT 620168-47-0, Ultrason E 7020P
RL: DEV (Device component use); USES (Uses)
(membranes; multilayered **electrolyte**-electrode membrane assemblies containing mineral acids, basic polymers, and a cation exchange-type barrier coating)

IT **110-86-1D**, Pyridine, derivs., **polymers**
288-13-1D, Pyrazole, derivs., **polymers**
288-88-0D, 1H-1,2,4-Triazole, derivs., **polymers**
289-06-5D, Thiadiazole, derivs., **polymers** 289-95-2D,

Pyrimidine, derivs., **polymers** 7258-75-5D,
Pyrimido[4,5,6-gh]perimidine, 1,6-dihydro-, derivs.,
polymers 27380-27-4D, Pek, sulfonated
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(membranes; multilayered **electrolyte**-electrode membrane assemblies containing mineral acids, basic polymers, and a cation exchange-type barrier coating)

L41 ANSWER 2 OF 8 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:396602 HCAPLUS Full-text
DOCUMENT NUMBER: 138:388180
TITLE: Method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell
INVENTOR(S): Melzner, Dieter; Kiel, Suzana; Maehr, Ulrich; Reiche, Annette
PATENT ASSIGNEE(S): Sartorius A.-G., Germany
SOURCE: Ger. Offen., 12 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10155545	A1	20030522	DE 2001-10155545 <--	20011112
DE 20217178	U1	20030430	DE 2002-20217178 <--	20021107
WO 2003043116	A1	20030522	WO 2002-EP12461 <--	20021107
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002350679	A1	20030526	AU 2002-350679 <--	20021107
EP 1451887	A1	20040901	EP 2002-785374 <--	20021107

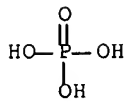
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK

JP 2005509695	T	20050414	JP 2003-544837	200211 07 <--
CN 1650462	A	20050803	CN 2002-821859	200211 07 <--
PRIORITY APPLN. INFO.:			DE 2001-10155543	IA 200111 12 <--
			DE 2001-10155545	IA 200111 12 <--
			WO 2002-EP12461	W 200211 07 <--

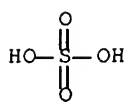
AB A **proton-conductive polymer electrolyte** membrane comprises ≥1 basic polymer and ≥1 dopant, which are the reaction product of ≥1 dibasic **inorg. acid** with an organic compound, whereby the reaction product contains an unreacted acid hydroxyl group. The **electrolyte** membrane can be fabricated in a single-stage procedure, by avoiding dangerous and polluting materials. The **electrolyte** membrane contains a high and a constant mech. stability and flexibility, excellent chemical and thermal stability and a high constant conductivity The membrane can be used in a fuel cell in a wide temperature range of, e.g., 50° to >200°, whereby the fuel cell shows a high and a constant efficiency over the entire temperature range.

IT **7664-38-2, Phosphoric acid**, processes
7664-93-9, Sulfuric acid, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)



IT **82370-43-2**, Polyimidazole
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)
RN 82370-43-2 HCAPLUS
CN 1H-Imidazole, homopolymer (CA INDEX NAME)

CM 1

CRN 288-32-4
CMF C3 H4 N2

IC ICM H01M008-02
ICS C08J005-22; C08G061-12
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST fuel cell **proton conductive polymer electrolyte** membrane
IT Amines, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(aliphatic, C5-20, substituted or unsubstituted; method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)
IT Alcohols, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(aliphatic, C5-20; method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)
IT Alcohols, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(aralkyl, substituted or unsubstituted; method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)
IT Amines, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(aromatic; method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)
IT Fuel cell **electrolytes**
(method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)
IT Polybenzimidazoles
Polybenzoxazoles
Polyoxadiazoles
Polyquinoxalines
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)

IT Fuel cells
(solid **electrolyte**; method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)

IT 104-76-7, 2-Ethylhexanol 108-95-2, Phenol, processes 298-07-7, Di(2-ethylhexyl)phosphate 838-85-7, Diphenyl phosphate 2425-79-8, 1,4-Butanediol diglycidyl ether **7664-38-2, Phosphoric acid**, processes **7664-93-9, Sulfuric acid**, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)

IT 25013-01-8, Polypyridine 31346-56-2 **82370-43-2**, Polyimidazole 128611-69-8, 1,3,4-Thiadiazole homopolymer 190201-51-5, Pyrimidine homopolymer
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)

IT 67-68-5, Dmso, uses 68-12-2, Dmf, uses 127-19-5, Dimethylacetamide 872-50-4, n-Methylpyrrolidone, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(method of fabrication of **proton-conductive polymer electrolyte** membrane for fuel cell)

L41 ANSWER 3 OF 8 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:171004 HCAPLUS Full-text
DOCUMENT NUMBER: 137:127444
TITLE: Imidazole and 1-methyl imidazole in **phosphoric acid** doped polybenzimidazole, **electrolyte** for fuel cells
AUTHOR(S): Schechter, Alex; Savinell, Robert F.
CORPORATE SOURCE: E.B. Yeager Center for Electrochemical Sciences, Case Western Reserve University, Cleveland, OH, 44106-7217, USA
SOURCE: Solid State Ionics (**2002**), 147(1,2), 181-187
CODEN: SSIOD3; ISSN: 0167-2738
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

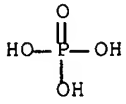
AB Imidazole and 1-Me imidazole (Me-Im) were used as additives in polybenzimidazole (PBI) equilibrated with **phosphoric acid** (PA), a system shown to be a high-temperature **proton -conducting polymer electrolyte**. The influence of different concns. of this additive on the conductivity of these membranes was measured by a four-probe conductivity measurement, at temps. in the range of 80-200 °C, under various humidity conditions. Correlation was found between the conductivity of liquid solns. of concentrated **phosphoric acid** and that of **H3PO4** in the PBI membranes.

IT **288-32-4**, Imidazole, uses **7664-38-2, Phosphoric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(imidazole and 1-Me imidazole in **phosphoric acid** doped polybenzimidazole membrane as **electrolyte** for fuel cells)

RN 288-32-4 HCAPLUS

CN 1H-Imidazole (CA INDEX NAME)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST imidazole **phosphoric acid** doped polybenzimidazole membrane **electrolyte** fuel cell; Me imidazole **phosphoric acid** doped polybenzimidazole **electrolyte** fuel cell
IT Fuel cell **electrolytes**
Fuel cell separators
(imidazole and 1-Me imidazole in **phosphoric acid** doped polybenzimidazole membrane as **electrolyte** for fuel cells)
IT Ionic conductivity
(membranes; imidazole and 1-Me imidazole in **phosphoric acid** doped polybenzimidazole membrane as **electrolyte** for fuel cells)
IT Polybenzimidazoles
RL: DEV (Device component use); USES (Uses)
(**polymer electrolyte**; imidazole and 1-Me imidazole in **phosphoric acid** doped polybenzimidazole membrane as **electrolyte** for fuel cells)
IT **288-32-4**, Imidazole, uses 616-47-7, 1-Methyl imidazole **7664-38-2**, **Phosphoric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(imidazole and 1-Me imidazole in **phosphoric acid** doped polybenzimidazole membrane as **electrolyte** for fuel cells)
REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 4 OF 8 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:335691 HCAPLUS Full-text
DOCUMENT NUMBER: 132:323960
TITLE: Materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells
INVENTOR(S): Brochu, Fernand; Duval, Michel
PATENT ASSIGNEE(S): Hydro-Quebec, Can.

SOURCE: PCT Int. Appl., 21 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000028611	A1	20000518	WO 1999-CA1022	19991102

<--

W: CA, JP
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

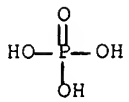
PRIORITY APPLN. INFO.: US 1998-186138 A 19981105

<--

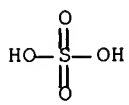
AB Organophosphoric materials obtained from the reaction of orthophosphoric acid with various organic reagents, including acetonitrile, acrylonitrile, a low mol. weight ether, a low mol. weight alc., or mixts. thereof are materials for use in **proton-conducting polymer electrolytes**. The novel organophosphoric materials have the beneficial effect of preventing the degradation of the polymers while still providing excellent ionic conductivity

IT **7664-38-2D**, Orthophosphoric acid, reaction product with acetonitrile **7664-93-9D, Sulfuric acid**, reaction product with organic reagent, uses **9003-47-8**, Polyvinylpyridine
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)

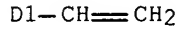


RN 9003-47-8 HCAPLUS

CN Pyridine, ethenyl-, homopolymer (CA INDEX NAME)

CM 1

CRN 1337-81-1
CMF C7 H7 N
CCI IDS



IC ICM H01M008-10
ICS H01M010-40; H01M006-18; G02F001-15; C07F009-09
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST organophosphoric material **proton conducting polymer electrolyte**; electrochromic device organophosphoric material **electrolyte**; battery organophosphoric material **electrolyte**; fuel cell organophosphoric material **electrolyte**
IT Polysulfones, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(aromatic; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT Alcohols, uses
Ethers, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(low mol. weight, reaction product with **inorg. acid**; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT Battery **electrolytes**
Conducting polymers
Electrochromic devices
Fuel cell **electrolytes**
(materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT Acrylic polymers, uses
Fluoropolymers, uses
Polyamides, uses
Polybenzimidazoles
Polyethers, uses
Polyimides, uses
Polythioarylenes
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT Sulfonic acids, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(perfluorosulfonic acid polymers; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

IT Fluoropolymers, uses
Fluoropolymers, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(sulfo-containing; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

IT 7631-86-9, Aerosil, uses
RL: MOA (Modifier or additive use); USES (Uses)
(colloidal; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

IT 9010-79-1, Ethylene-propylene copolymer
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(fluorinated; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

IT 75-05-8D, Acetonitrile, reaction product with orthophosphoric acid, uses 107-13-1D, Acrylonitrile, reaction product with orthophosphoric acid 7601-90-3D, Perchloric acid, reaction product with organic reagent, uses **7664-38-2D**, Orthophosphoric acid, reaction product with acetonitrile **7664-38-2D**, Orthophosphoric acid, reaction product with organic reagent **7664-93-9D**, **Sulfuric acid**, reaction product with organic reagent, uses 9002-89-5, Pva 9003-05-8, Polyacrylamide 9003-20-7, Polyvinyl acetate 9003-39-8 **9003-47-8**, Polyvinylpyridine 24937-79-9, Pvdf 57271-36-0, Butylene-ethylene-styrene copolymer 90622-00-7D, Benzene, ethenyl-, trifluoro derivative, sulfonic acid derivative 105809-46-9D, Polypyrazole, aromatic derivative
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 5 OF 8 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1995:972997 HCAPLUS Full-text
DOCUMENT NUMBER: 124:33632
TITLE: A H2/O2 fuel cell using acid doped polybenzimidazole as **polymer electrolyte**
AUTHOR(S): Wang, J.-T.; Savinell, R. F.; Wainright, J.; Litt, M.; Yu, H.
CORPORATE SOURCE: Dep. Chem. Eng., Case Western Reserve Univ., Cleveland, OH, 44106, USA
SOURCE: Electrochimica Acta (**1996**), 41(2), 193-7
CODEN: ELCAAV; ISSN: 0013-4686
PUBLISHER: Elsevier

DOCUMENT TYPE: Journal
LANGUAGE: English

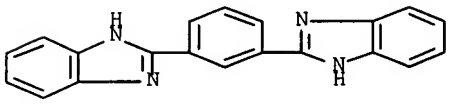
AB **Phosphoric acid** doped polybenzimidazole (PBI-poly[(2,2'-m-phenylene)-5,5'-bibenzimidazole]) has been investigated for use in a H2/O2 fuel cell. The prototype fuel cell test results show that the PBI fuel cell worked quite well at 150° with atmospheric pressure hydrogen and oxygen which were humidified at room temperature No membrane dehydration was observed over 200 h operating. The maximum power d. of this prototype fuel cell was 0.25 W cm-2 at c.d. of 700 mA cm2. Further improvement of the cell performance is to be anticipated by properly impregnating the electrode structure with the **polymer electrolyte** . The advantage of the H2/O2 fuel cell using PBI as **polymer electrolyte** is that the cell design and the routine maintenance can be significantly simplified because of the low electro-osmotic drag number and good **proton conductivity** of the PBI membrane at elevated temperature

IT **81751-25-9**
RL: DEV (Device component use); USES (Uses)
(hydrogen-oxygen fuel cell using acid doped polybenzimidazole as **polymer electrolyte**)

RN 81751-25-9 HCAPLUS
CN 1H-Benzimidazole, 2,2'-(1,3-phenylene)bis-, homopolymer (9CI) (CA INDEX NAME)

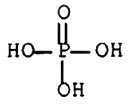
CM 1

CRN 29914-81-6
CMF C20 H14 N4



IT **7664-38-2, Phosphoric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(hydrogen-oxygen fuel cell using acid doped polybenzimidazole as **polymer electrolyte**)

RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST **phosphoric acid** doped polybenzimidazole **electrolyte**; fuel cell **electrolyte** acid doped polybenzimidazole

IT Fuel-cell **electrolytes**
(hydrogen-oxygen fuel cell using acid doped polybenzimidazole as **polymer electrolyte**)

IT Polybenzimidazoles

RL: DEV (Device component use); USES (Uses)
(hydrogen-oxygen fuel cell using acid doped polybenzimidazole as **polymer electrolyte**)

IT **81751-25-9**
RL: DEV (Device component use); USES (Uses)
(hydrogen-oxygen fuel cell using acid doped polybenzimidazole as **polymer electrolyte**)

IT **7664-38-2, Phosphoric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(hydrogen-oxygen fuel cell using acid doped polybenzimidazole as **polymer electrolyte**)

L41 ANSWER 6 OF 8 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1995:845461 HCAPLUS Full-text
DOCUMENT NUMBER: 123:261671
TITLE: A H2/O2 fuel cell using acid doped polybenzimidazole as **polymer electrolyte**
AUTHOR(S): Wang, J.-T.; Wainright, J.; Yu, H.; Litt, M.; Savinell, R. F.
CORPORATE SOURCE: Dep. Chem. Eng., Case Western Reserve Univ., Cleveland, OH, 44106, USA
SOURCE: Proceedings - Electrochemical Society (**1995**), 95-23(Proton Conducting Membrane Fuel Cells I), 202-13
CODEN: PESODO; ISSN: 0161-6374
PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

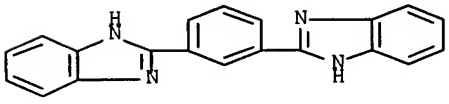
AB **Phosphoric acid** doped polybenzimidazole (PBI-poly[2,2'-(m-phenylene)-5,5'-bibenzimidazole]) has been investigated for use in a H2/O2 fuel cell. The prototype fuel cell test results show that the PBI fuel cell worked quite well at 150° with atmospheric pressure hydrogen and oxygen which were humidified at room temperature No membrane dehydration was observed over 200 h operating. The maximum power d. of this prototype fuel cell was 0.25 W/cm2 at c.d. of 700 mA/cm2. Further improvement of the cell performance is to be anticipated by properly impregnating the electrode structure with the **polymer electrolyte** . The advantage of the H2/O2 fuel cell using PBI as **polymer electrolyte** is that the cell design and the routine maintenance can be significantly simplified because of the low electro-osmotic drag number and good **proton conductivity** of the PBI membrane at elevated temperature

IT **81751-25-9**
RL: DEV (Device component use); USES (Uses)
(**electrolyte, phosphoric acid** -doped; hydrogen-oxygen fuel cell with)

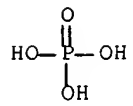
RN 81751-25-9 HCAPLUS
CN 1H-Benzimidazole, 2,2'-(1,3-phenylene)bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 29914-81-6
CMF C20 H14 N4



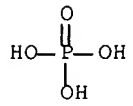
IT **7664-38-2, Phosphoric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polybenzimidazole **electrolyte** oped with;
hydrogen-oxygen fuel cell with)
RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST hydrogen oxygen fuel cell **polymer electrolyte**;
polybenzimidazole **electrolyte** hydrogen oxygen fuel cell
IT Polybenzimidazoles
RL: DEV (Device component use); USES (Uses)
(**electrolyte, phosphoric acid**
-doped; hydrogen-oxygen fuel cell with)
IT Fuel-cell **electrolytes**
(**phosphoric acid** doped polybenzimidazole;
hydrogen-oxygen fuel cell with)
IT **81751-25-9**
RL: DEV (Device component use); USES (Uses)
(**electrolyte, phosphoric acid**
-doped; hydrogen-oxygen fuel cell with)
IT **7664-38-2, Phosphoric acid**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polybenzimidazole **electrolyte** oped with;
hydrogen-oxygen fuel cell with)

L41 ANSWER 7 OF 8 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1993:412029 HCAPLUS Full-text
DOCUMENT NUMBER: 119:12029
TITLE: Smart window using a **proton conducting polymer** as **electrolyte**
AUTHOR(S): Lassegues, Jean Claude; Rodriguez, Doris
CORPORATE SOURCE: Lab. Spectrosc. Mol. Crist., Univ. Bordeaux I, Talence, 33405, Fr.
SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (**1992**), 1728(Optical Materials Technology for Energy Efficiency and Solar Energy Conversion XI: Chromogenics for Smart Windows), 241-9
CODEN: PSISDG; ISSN: 0277-786X
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A prototype of smart window was built using oxides of W and Ir as complementary electrochromic electrodes and **proton- conducting polymer electrolytes** obtained by dissolving **H3PO4** into basic polymers. The main properties of the individual layers were described. The performances and limitations of a complete cell were discussed in terms of optical efficiency, response time, memory effect, and cyclability.

IT **7664-38-2P, Phosphoric acid**, uses
RL: PREP (Preparation); USES (Uses)
(polymer containing dissolved, **proton-conducting, electrolyte**, electrochromic smart windows with, manufacture and performance of)
RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



IT **9002-98-6P**
RL: PREP (Preparation)
(**proton-conducting** branched, **electrolyte**, electrochromic smart windows with, manufacture and performance of)
RN 9002-98-6 HCAPLUS
CN Aziridine, homopolymer (CA INDEX NAME)

CM 1

CRN 151-56-4
CMF C2 H5 N

CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST electrochromic smart window prototype manuf; tungsten oxide electrochromic electrode smart window; iridium oxide electrochromic electrode smart window; **proton conducting polymer electrolyte** electrochromic window
IT Electric conductivity and conduction
(of poly(ethyleneimine) and poly(acrylamide), **phosphoric acid** concentration effect on)
IT Polymers, uses
RL: USES (Uses)
(**proton-conducting**, electrochromic smart windows with, manufacture and performance of)
IT Windows
(electrochromic, smart, with **proton-conducting polymer electrolyte**, manufacture and performance of)
IT **7664-38-2P, Phosphoric acid**, uses
RL: PREP (Preparation); USES (Uses)
(polymer containing dissolved, **proton-conducting, electrolyte**, electrochromic smart windows with, manufacture and performance of)
IT **9002-98-6P**
RL: PREP (Preparation)
(**proton-conducting** branched,

electrolyte, electrochromic smart windows with, manufacture and performance of)

IT 9003-05-8P, Poly(acrylamide)
RL: PREP (Preparation)
(**proton-conducting, electrolyte**, electrochromic smart windows with, manufacture and performance of)

L41 ANSWER 8 OF 8 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1989:138716 HCAPLUS Full-text
DOCUMENT NUMBER: 110:138716
TITLE: Hydrogen separation and electricity generation using novel three-component membrane
INVENTOR(S): Young, Ping; Polak, Anthony J.
PATENT ASSIGNEE(S): Allied-Signal, Inc., USA
SOURCE: U.S., 13 pp. Cont. of U.S. Ser. No. 753,495, abandoned.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4795536	A	19890103	US 1987-70622 <--	19870706
PRIORITY APPLN. INFO.:			US 1985-753495 A1 <--	19850710

AB An apparatus for performing an electrochem. process involving a gaseous mixture having a component which in presence of a catalytic agent is capable of dissociating to yield H+ or of combining with H+ comprises a thin-film polymer-blend membrane, a membrane housing comprising a 1st and a 2nd gas chamber separated by the membrane, 2 sep. portions of catalytic agent effective to promote the dissociation and combination, and means for forming elec. connection in operative contact with the catalytic agent. The apparatus comprises also means to supply fuel gas to 1 and oxidant gas to the other of the 2 chambers, or to supply the gaseous mixture to 1 and remove H from the other of the 2 chambers. The membrane possessing a high **H+ cond** . and formed by removing the solvent from a solution of a blend of 3 components: H2PO3, HPO3, **H3PO4**, H4P2O7, and polyphosphoric acid .apprx.10-50; an organic polymer such as poly(vinyl alc.), poly(vinyl fluoride), etc. .apprx.40-80; and a poly(organic acid) such as poly(acrylic acid) .apprx.10-40 mol%. For increased strength, a membrane may be composited with or attached to a porous support. In 1 version, elec. conductive particles with catalyst are partly embedded in the membrane to form a H separating device.

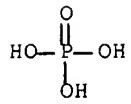
IT **9002-98-6**, Polyethylenimine
RL: USES (Uses)
(**electrolyte** membranes from blends containing **phosphoric acid**-poly(organic acid)-, for fuel cells and hydrogen separation)

RN 9002-98-6 HCAPLUS
CN Aziridine, homopolymer (CA INDEX NAME)

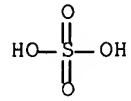
CM 1

CRN 151-56-4
CMF C2 H5 N

IT **7664-38-2, Phosphoric acid**, uses and miscellaneous **7664-93-9, Sulfuric acid**, uses and miscellaneous
RL: USES (Uses)
(**electrolyte** membranes from blends containing polymer-poly(organic acid)-, for fuel cells and hydrogen separation)
RN 7664-38-2 HCAPLUS
CN Phosphoric acid (CA INDEX NAME)



RN 7664-93-9 HCAPLUS
CN Sulfuric acid (CA INDEX NAME)



IC ICM C25B001-02
ICS C25B009-00
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 72
ST hydrogen **electrolytic** sepn composite **electrolyte**; fuel cell solid **electrolyte** composite; **phosphoric acid polymer** **electrolyte** composite; polyorg acid **polymer** **electrolyte** composite; cond solid **electrolyte** composite
IT Fuel cells
(**electrolyte** membranes for, **phosphoric acid**-polymer-poly(organic acid) blend)
IT Polyphosphoric acids
RL: USES (Uses)
(**electrolyte** membranes from blends containing polymer-poly(organic acid)-, for fuel cells and hydrogen separation)
IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6**, Polyethylenimine 9004-35-7, Cellulose acetate 24981-14-4, Poly(vinyl fluoride) 25322-68-3, Polyethylene glycol
RL: USES (Uses)

(**electrolyte** membranes from blends containing **phosphoric acid**-poly(organic acid)-, for fuel cells and hydrogen separation)

IT 9003-01-4, Poly(acrylic acid) 25087-26-7, Poly(methacrylic acid) 50851-57-5, Poly(styrenesulfonic acid)
RL: USES (Uses)
(**electrolyte** membranes from blends containing **phosphoric acid**-polymer-, for fuel cells and hydrogen separation)

IT 2466-09-3, Pyrophosphoric acid **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous 7803-60-3, Hypophosphoric acid 10343-62-1, Metaphosphoric acid
RL: USES (Uses)
(**electrolyte** membranes from blends containing polymer-poly(organic acid)-, for fuel cells and hydrogen separation)

IT 1333-74-0P, Hydrogen, preparation
RL: PREP (Preparation)
(separation of, **electrolyte** membranes from **phosphoric acid**-polymer-poly(organic acid) for)

=>